

Basic Integration Formulas

$$\int a \, dx = ax + C$$

$$\int x^r \, dx = \frac{x^{r+1}}{r+1} + C \quad [r \neq -1]$$

$$\int \frac{1}{x} \, dx = \ln |x| + C$$

$$\int \frac{dx}{a^2 + x^2} = \frac{1}{a} \tan^{-1} \frac{x}{a} + C$$

$$\int \frac{dx}{\sqrt{a^2 - x^2}} = \sin^{-1} \frac{x}{a} + C \quad [a > 0]$$

$$\int \frac{dx}{x\sqrt{x^2 - a^2}} = \frac{1}{a} \sec^{-1} \frac{x}{a} + C \quad [a > 0]$$

$$\int e^x \, dx = e^x + C$$

$$\int a^x \, dx = \frac{a^x}{\ln a} + C \quad [a > 0]$$

$$\int xe^x \, dx = e^x(x - 1) + C$$

$$\int \ln x \, dx = x \ln x - x + C$$

$$\int \sin x \, dx = -\cos x + C$$

$$\int \cos x \, dx = \sin x + C$$

$$\int \tan x \, dx = \ln |\sec x| + C$$

$$\int \sec x \, dx = \ln |\sec x + \tan x| + C$$

$$\int \cot x \, dx = \ln |\sin x| + C$$

$$\int \csc x \, dx = \ln |\csc x - \cot x| + C$$

$$\int \sec^2 x \, dx = \tan x + C$$

$$\int \csc^2 x \, dx = -\cot x + C$$

$$\int \sec x \tan x \, dx = \sec x + C$$

$$\int \csc x \cot x \, dx = -\csc x + C$$

$$\int \sin^2 x \, dx = \frac{x}{2} - \frac{\sin 2x}{4} + C$$

$$\int \cos^2 x \, dx = \frac{x}{2} + \frac{\sin 2x}{4} + C$$

$$\int \tan^2 x \, dx = \tan x - x + C$$